AN IDEA FOR THE
HAMMERSMITH BRIDGE
ISSUE

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ABSTRACT: The 132-year-old Hammersmith Bridge has been closed to motor traffic since April 2019. This beautiful suspension structure needs to be seriously repaired again. Although the bridge was significantly damaged by the bombings of 1939, 1996, and 2000, it has continued to serve the community successfully. Hammersmith Bridge is a beautiful example of innovation in 19th-century British Engineering and an iconic West London structure.

This paper contains a summary description of the existing bridge issue and proposed solution. Different design options are summarised, and a sketch of a new bridge is proposed.

KEYWORDS: *Hammersmith Bridge, proposed structure, modern bridge, beautiful suspension structure, structure retirement, green bridge, viewing platform, iconic landmark, historic structure, motor traffic closure*

FIGURE 1: EXISTING HAMMERSMITH BRIDGE

1. INTRODUCTION

Hammersmith Bridge is a three-span suspension bridge in the London Borough of Hammersmith & Fulham (LBHF).

- Hammersmith-side (North) Span: 46.9m
- Main Span: 128.6m
- Barnes-side (South) Span: 47.9m

The total length of the existing Hammersmith Bridge is 223.4m. The bridge rests on two abutments and two piers. The span is straight without any skew.

It connects Hammersmith Bridge Road to Castelnau in North Barnes, crossing over the River Thames in west London.

The bridge was declared a Grade II* listed structure in 2008 for the following principal reasons: "*The architectural quality of Hammersmith Bridge is remarkable in both forms, with its monumental towers, and ornamentation, as seen in the lavish colour scheme and heraldry; the bridge is one of the most distinctive on the Thames*" [1].

Hammersmith Bridge has a total width of 13.1m, featuring an 8.2m clear carriageway formed from wrought-iron girders, along with two footways on either side.

The bridge reopened with a 7.5-tonne weight limitation after structural repair works were undertaken in 1997.

Hammersmith Bridge was closed to all motor traffic in April 2019 following the discovery of cracks in the bridge's pedestals, the footings that support the structure.

Transport for London (TfL) and Hammersmith & Fulham (H&F) Council estimate that the work could cost £120m and is expected to take approximately three years. This bridge connects the north Barnes area to the Hammersmith area and plays a vital role in these two regions, particularly for the north Barnes area.

2. SUMMARY OF THE PROBLEM AND PROPOSED SOLUTION

The damage caused by the closed bridge to the businesses in these two regions (Hammersmith & North Barnes) has already been highlighted in numerous articles. Diverting all traffic to the nearby streets is highly disruptive and time-consuming. Furthermore, for those who previously used the bridge every day, this situation is a significant waste of time. For instance, a journey that would take 10 minutes now takes about 25 minutes. If we multiply the difference of 15 minutes by the number of people using this bridge, we arrive at a substantial figure that reflects the loss of time and money for the citizens.

But the fundamental question is;

"Do we expect all structures, regardless of their ages, to continue their 100% performance forever?"

Structures, in one respect, are like humans, but with a much longer lifespan. People are more efficient when they are young; however, as they age, they possess less power and energy, utilising their abilities differently. We should treat structures the same way. Structures can operate efficiently, as they were designed to, in their youth. Over time, however, this capability diminishes, and a point is reached where it becomes economically rational to repurpose these structures. In other words, we should find a method to retire them.

"Structures Retirement" does not imply that we will cease using them; rather, it signifies a decision to lessen the loads on them in order to restore and make use of them for many more years.

Hammersmith Bridge, after 132 years of continuous operation and having endured damage from bombings, appears to have reached its retirement age. However, it can serve as a "Green Bridge" for a direct connection between Hammersmith and North Barnes. It can be effectively utilised for pedestrian crossings and cycling. To accommodate vehicular traffic, a new bridge could be constructed to satisfy the traffic needs of the area. Needless to say, with the proper use of the existing bridge (less loading), it can have a longer lifespan.

3. COMPARE FOUR OPTIONS

OPTION 1: Keeping the existing Bridge as it is. No repairs:

- Allows the existing bridge for pedestrians and cyclists.
- Carrying out no repairs to the bridge, so no need for money to spend;
- Will not meet the vehicular traffic demands for now and the future, meaning that several London bus routes are being diverted.

OPTION 2: Carrying out a partial repair to the existing bridge:

- Still does not solve the usage restrictions (e.g. 7.5t weight limit), due to concerns about the elderly structure, and restricts its weight load to only single-decker buses;
- Will not meet the increasing traffic demands in the future;
- This option is financially cheaper than option 3.

OPTION 3: Fully repair the existing Hammersmith Bridge:

- Is very expensive (around £120m according to early-stage estimation);
- Still does not solve the usage restrictions (e.g. 7.5t weight limit);
- Will not meet the increasing traffic demands in the future;
- And as the existing bridge is quite old, it needs to be repaired periodically, which would not be financially viable.

OPTION 4: Constructing a new bridge and restoring the existing:

- Needs to invest a substantial amount of money at the start, but will result in saving money for the future;
- Gives another alternative access between Hammersmith and Barnes areas;

- Allows the existing bridge to be a 'Green Bridge' for pedestrians and cyclists. It can be redesigned as a Viewing Platform and Recreational Area as well;
- Will attract lots of tourists as a Point of Interest and boost the businesses located on both sides; as has occurred with the Millennium Bridge to the east of the River Thames;
- It will be designed to meet future traffic load requirements.

4. PROPOSED BRIDGE FEATURES

The new bridge will connect Great West Road (A4) from 'Furnivall Gardens' to North Barnes. The area taken from Furnivall Gardens is approximately 1,550 m², and the new bridge, spanning the River Thames, will utilise part of St. Paul's school grounds (around 1,450 m²). The total length of the proposed road is roughly 400 metres, while the new bridge measures about 260 metres in length. It is a three-span bridge.

- ✓ • North Span: 35 m
- ✓ • Centre Span: 190 m
- ✓ • South Span: 35 m

The new bridge can be considerably stronger and more secure, taking inspiration from the architectural features of the existing Hammersmith Bridge. The initial sketch provided can serve to address the needs and inspirations derived from the architectural characteristics of the current bridge.

5. EXISTING & PROPOSED BRIDGE PLANS & 3D SKETCHES

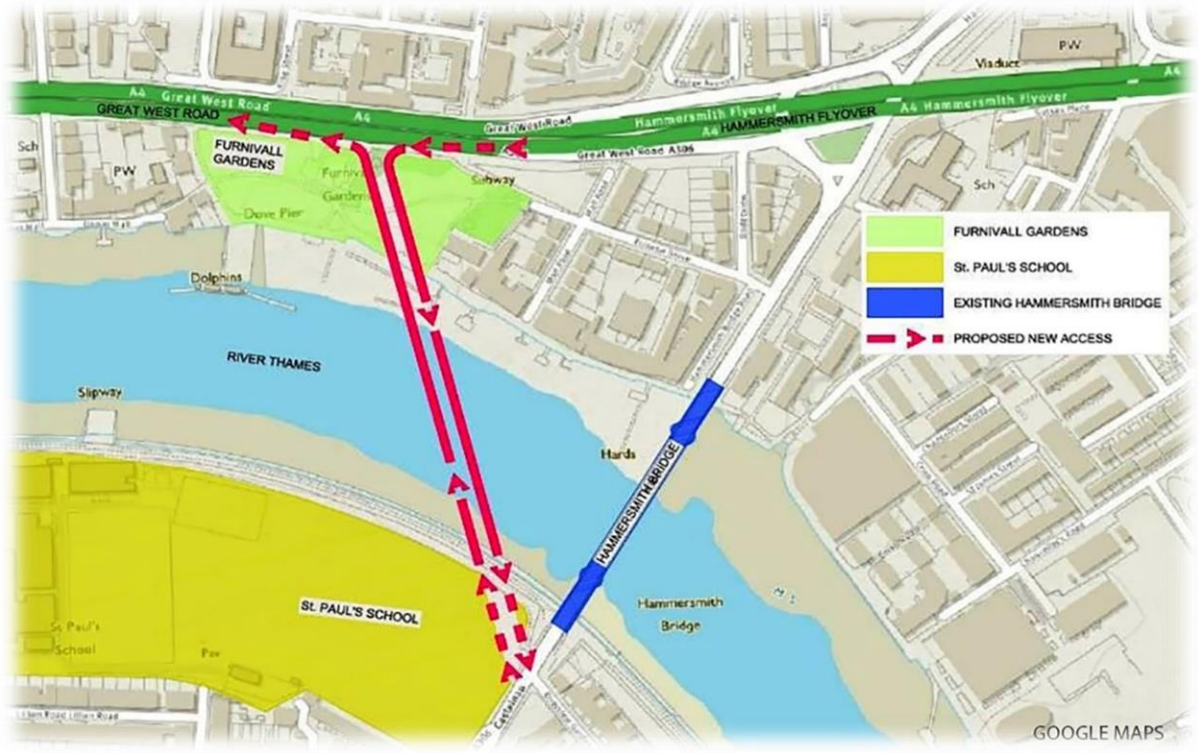

FIGURE 2: EXISTING PLAN SHOWING PROPOSED NEW ACCESS

GOOGLE MAPS

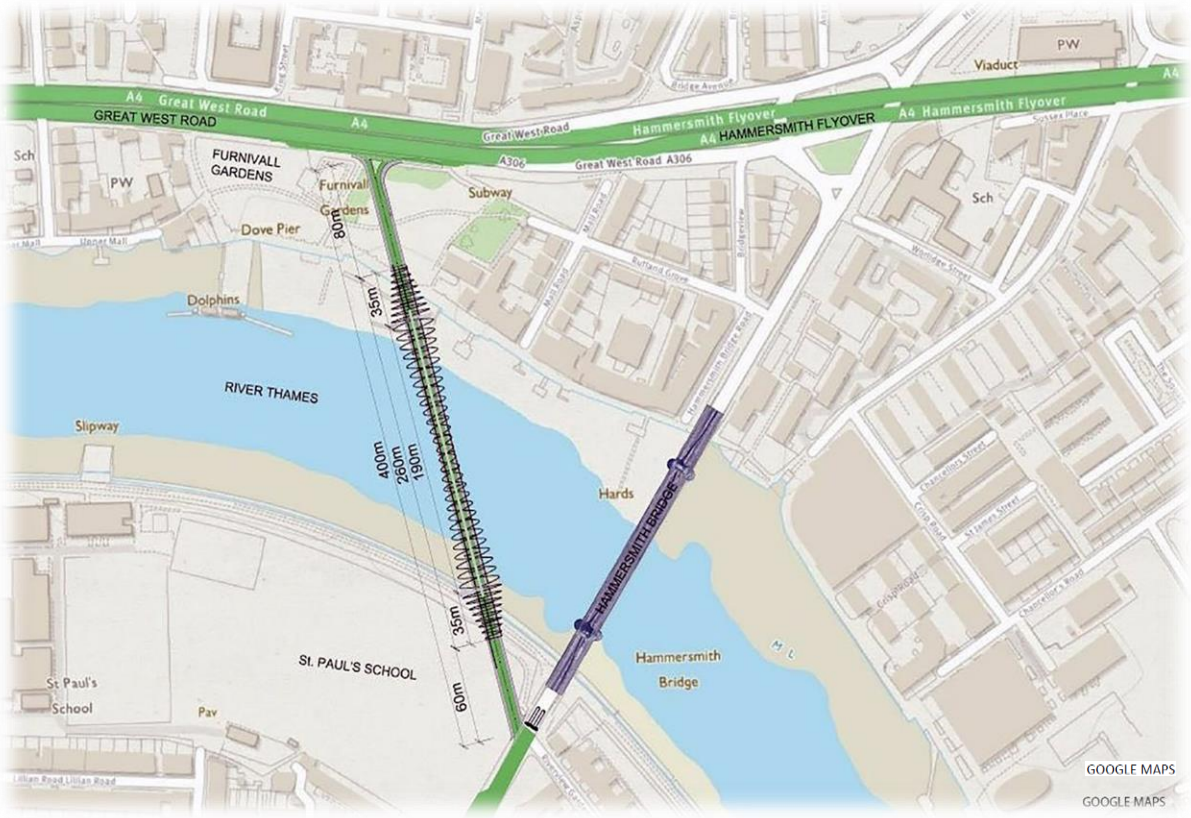

FIGURE 3: PROPOSED PLAN

FIGURE 4: 3D BIRD'S EYE VIEW SKETCH

FIGURE 5: 3D VIEW

FIGURE 6: 3D VIEW & CROSS SECTION

This conceptual proposal envisions a two-tiered bridge structure that distinctly separates motorised and non-motorised traffic. The lower deck is designated for vehicular use, while the upper deck serves as a dedicated green promenade for pedestrians, fostering an environmentally sustainable and user-friendly urban corridor.

Architecturally, the bridge adopts a contemporary and visually distinctive form that integrates modern engineering aesthetics with functional design. The foundations and supporting piers are strategically positioned on both sides of the river, broadly aligning with the existing infrastructure of the original Hammersmith Bridge. This alignment respects the historical context of the site and seeks to minimise environmental and urban disruption during construction.

It is important to note that this proposal represents a preliminary design concept. Comprehensive structural analysis and feasibility studies are required to determine the optimal engineering solution. Depending on the outcomes of these evaluations, the final design may evolve into a cable-stayed or suspension bridge configuration to ensure the necessary structural performance and resilience.

6. Appendix – Conceptual Design Alternatives

This appendix presents three supplementary conceptual design alternatives, each illustrated with an original sketch. These proposals aim to broaden the scope of the design dialogue by exploring a diverse range of structural, functional, and aesthetic strategies that address the complex challenges associated with the Hammersmith Bridge.

While the primary proposal advocates for constructing a new bridge to complement and alleviate pressure on the existing historic structure, the alternatives outlined here investigate other viable approaches that seek to balance heritage preservation with contemporary infrastructure requirements. Each concept provides a distinct response to the dual imperatives of maintaining the cultural and architectural significance of the site while meeting evolving transportation demands.

The design variations differ in form, engineering methodology, and degree of integration with the surrounding urban and natural context. These alternatives exemplify a context-sensitive and adaptable design philosophy that prioritises both technical feasibility and the character of the built environment.

The inclusion of these alternative concepts serves multiple purposes: to encourage critical reflection, to foster informed dialogue among stakeholders, and to facilitate a more comprehensive evaluation of potential solutions. By presenting multiple scenarios, this appendix supports a collaborative and transparent decision-making process that aspires to achieve a sustainable, resilient, and respectful long-term strategy for the future of Hammersmith Bridge and its environs.

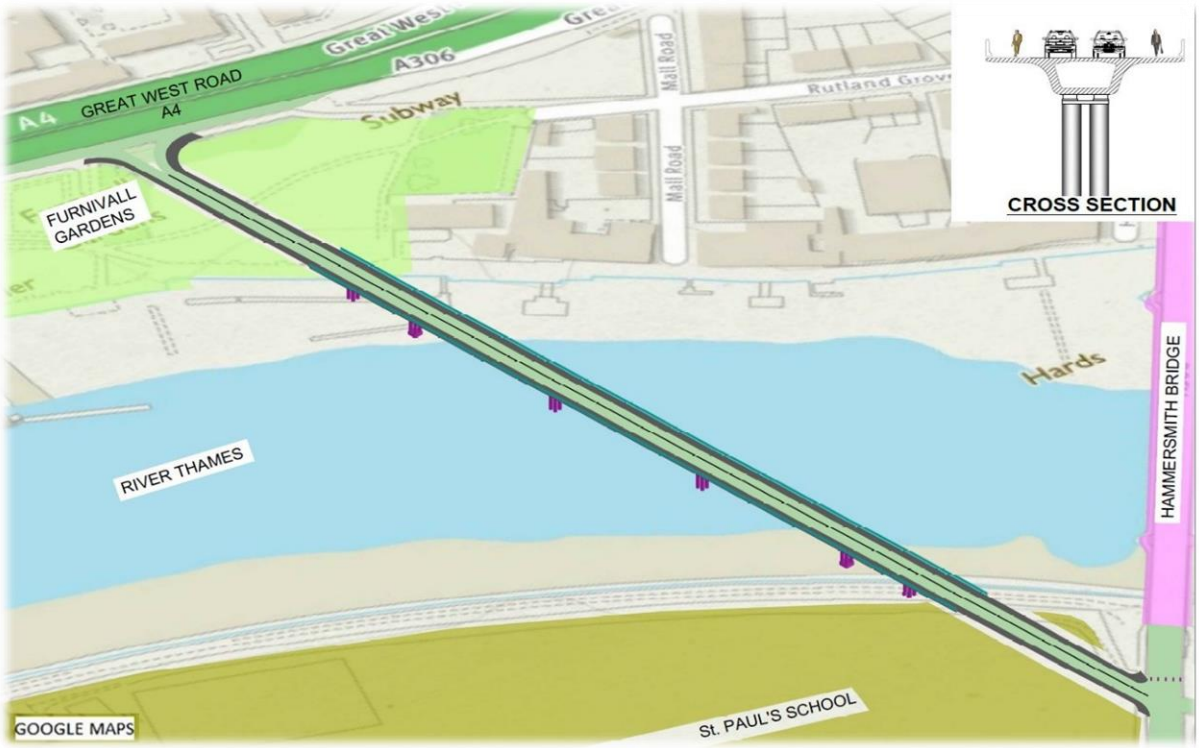

Figure A1: Alternative Design Option 1

This sketch proposes a new bridge for vehicles and pedestrians constructed alongside the existing Hammersmith Bridge, allowing the original structure to be reserved exclusively for pedestrians and cyclists. This alignment minimises disruption to heritage views while addressing contemporary traffic needs.

Figure A2: Alternative Design Option 2 – Modern Cable-Stayed Bridge

This alternative envisions a cable-stayed bridge that emphasises structural efficiency, architectural elegance, and harmony with the surrounding urban landscape. It also allows the original Hammersmith Bridge to be reserved exclusively for pedestrians and cyclists.

Figure A3: Alternative Design Option 3 – Modern Cable-Stayed Bridge

This sketch envisions a cable-stayed bridge that blends aesthetic inspiration from the previously proposed structure (Figure 5) with a contemporary form. It emphasises structural efficiency, architectural elegance, and harmony with the surrounding urban landscape. The original Hammersmith Bridge is intended to be reserved exclusively for pedestrians and cyclists.

7. Conclusion

The Hammersmith Bridge, a distinguished example of 19th-century British engineering and a Grade II* listed structure, has reached a critical juncture in its lifecycle due to cumulative structural fatigue and evolving urban demands. This paper has methodically examined the limitations of maintaining the bridge in its current form and assessed four strategic options, concluding that preserving the existing bridge as a pedestrian and cycling “Green Bridge,” while simultaneously constructing a new vehicular and pedestrian bridge, offers the most sustainable, economical, and context-sensitive solution.

This dual-bridge strategy provides a pragmatic balance between heritage conservation and contemporary urban mobility needs. By reallocating motor traffic to a new, structurally resilient crossing and reducing load demands on the historic bridge, the proposal not only prolongs the functional lifespan of the original structure but also enhances the urban landscape through the creation of a public promenade and viewing platform. Moreover, the

proposed bridge design, with its two-tiered configuration and architectural references to the original, demonstrates how modern infrastructure can harmonise with historical context while addressing future transportation challenges.

Ultimately, the proposal advances a forward-thinking model of "structure retirement," wherein ageing yet culturally valuable infrastructure is adaptively repurposed rather than decommissioned, promoting both environmental sustainability and civic enrichment. This concept could serve as a precedent for other cities facing similar dilemmas at the intersection of preservation and progress.

8. REFERENCES

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